

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number
WO 2005/064315 A1(51) International Patent Classification⁷: G01N 21/33,
21/31, H01L 31/0264, 31/0352(21) International Application Number:
PCT/IB2004/004253(22) International Filing Date:
22 December 2004 (22.12.2004)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
BA2003A000066
22 December 2003 (22.12.2003) IT

(71) Applicant (for all designated States except US): CONSIGLIO NAZIONALE DELLE RICERCHE - INFM ISTITUTO NAZIONALE PER LA FISICA DELLA MATERIA [IT/IT]; Corso F. Perrone, 24, I-16152 Genova (IT).

(72) Inventors; and
(75) Inventors/Applicants (for US only): LA FORGIA, Domenico [IT/IT]; Via Nicolai, 20, I-70122 Bari (IT). DE RISI, Arturo, Antonio [IT/IT]; Pitta Toscanini, 1, I-73100 Lecce (IT). DE VITTORIO, Massimo [IT/IT]; Corte dei Giugni, 12, I-73100 Lecce (IT). CINGOLANI, Roberto [IT/IT]; Via E. Indraccolo, 20, I-73100 Lecce (IT). PASSASEO, Adriana [IT/IT]; Via Vecchia San Cesario, 3, I-73040 Lecce (IT). LOMASCOLO, Mauro [IT/IT]; Piazza L. Ariosto, 21, I-73100 Lecce (IT).

(74) Agents: DEAMBROGI, Edgardo et al.; Jacobacci & Partners SpA, Corso Emilia 8, I-10152 Torino (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

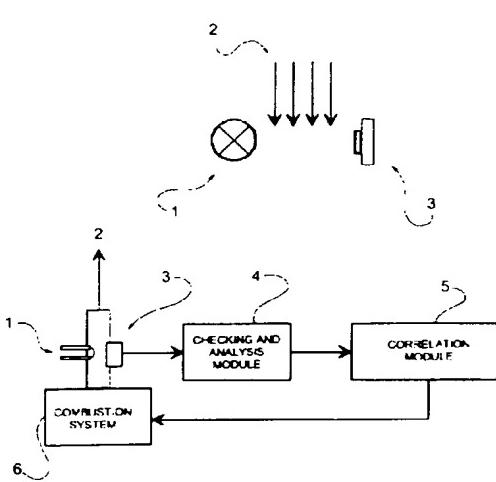
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: AN OPTICAL SYSTEM FOR DETECTING THE CONCENTRATION OF COMBUSTION PRODUCTS



(57) Abstract: Optical system for detecting the concentration of combustion products operating in situ and at high temperature based on measurement of the optical absorption of a gaseous mixture of combustion products through a photodetecting sensor based on gallium nitride (GaN), aluminium nitride (AlN), indium nitride (InN) and corresponding alloys. The operating temperature of the sensor preferably lies between 500 °C and 700 °C, but the resistance of the active material permits use at even higher temperatures. This system can be used to measure the concentration of chemical species present in combustion products directly at their outlet, where the high operating temperature makes it possible to avoid fouling of the sensor caused by carbonaceous and non-carbonaceous deposits. The rate of response of the system is less than or equal to 1 millisecond and makes it possible to adjust the parameters of an associated combustion process control system in real time.



*TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG)
— of inventorship (Rule 4.17(iv)) for US only*

Published:

— *with international search report*

(48) Date of publication of this corrected version:

16 February 2006

(15) Information about Correction:

see PCT Gazette No. 07/2006 of 16 February 2006, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.